SCIENCE.—SUPPLEMENT.

FRIDAY, JANUARY 15, 1886.

THE EIGHT-HOUR DAY.

CONSIDERING the interest which is everywhere awakened in face of the coming determined agitation for an eight-hour day, the pamphlet by H. W. Fabian, on 'Der gesetzliche achtstundige normal-arbeitstag' (*Social science publishing company*, New York), is quite opportune. It constitutes the first number of a cheap series devoted to economic and social questions. Apart from its purpose of concentrating certain facts concerning the development of legislation on this subject, it is perhaps noticeable as indicating the diffusion of the writing and theories of Marx. His philosophy is accepted as laying the basis for state action in economic matters. It is a debated question, even among the labor-leaders, as to whether they will be able to carry into successful operation their plan for the general adoption of the eight-hour day on May 1, 1886. This is the date determined upon by the federation of labor unions of the United States and Canada. Such a thorough-going undertaking has immense difficulties before it, if it is managed simply as an economic movement. Many trades are not thoroughly organized; large numbers of workmen have no savings; and of course, if a general strike in all industries be resorted to, there could be little hope of mutual aid. Again: the system of piece-work is a standing obstacle. This is seen in the case of cigar-makers who work in tenement-houses. Mr. Fabian, therefore, urges the necessity of combined political action: economic forces alone are not sufficient. Those who are perplexed and possibly exasperated by this movement should make themselves familiar with the history of the labor-day. Even so conservative an investigator as Thorold Rogers has shown, that, in battling for the eight-hour day, the workman is only claiming his inheritance which he possessed less than five centuries ago. The demand is not a radical one; and no question was ever more temperately discussed than this at the recent Washington labor congress. For more than a quarter of a century the working-day in Australia has been of but eight hours; and last April the anniversary of its introduction was celebrated by artisans, manufacturers, and government officials. All these united in a declaration of its success.

E. Y.

SHELL-FISH IN CONNECTICUT.

THE 'Fifth report of the shell-fish commissioners of the state of Connecticut,' for 1885, shows that the total area of oyster-grounds, for which application has been made to the commission (or their predecessors in certain places, the town committees) exceeds a hundred and twenty-four thousand acres. This, it is understood, excludes all natural beds or property owned by towns for the common benefit. Of the total, nearly eighty thousand acres have already been granted, of which sixteen thousand two hundred are under cultivation. Such portions of the remainder as are held for speculation, and not cultivated, revert to the state after five years, at the order of court, on a proper showing. In 1885 there were four hundred and twenty-three tax-paying cultivators, and the nominal price fixed on the grounds has yielded the state over fifty thousand dollars. The commissioners recommend the repeal of that section of the law which excludes non-residents from its privileges; as the local oyster-growers have had full opportunity for securing such lands as they could use, and, ignorantly or intentionally, non-residents have secured ownership through a merely fictitious compliance with the letter of the law. Of taxes levied, all but fifty-five dollars have been collected; the tax produced nearly eight thousand dollars the present year, and nearly eighteen thousand dollars during the entire three years. Much available ground still remains open to designation.

The experience of cultivators shows, that with proper dredging vigilantly kept up, and a suitable state supervision of the natural beds, the starfish may be kept under so as to do but little damage. A new pest was reported in the worm Sabellaria vulgaris Verrill, which builds interlocking sand-tubes with great rapidity, which, when numerous enough, smother the oysters on which they rest. One bed containing seventy-eight thousand bushels was nearly destroyed in this way; but it seems that such a result is very rare, as no further serious damage from this cause has been reported, and it is possible the loss in question was over-estimated.

The oyster-fleet of 1885 comprised 49 steamers, with a capacity of 50,525 bushels.

Mr. Bogart, the efficient engineer of the comission, reports on his part of the work, which is chiefly occupied with the survey of the state oyster-grounds, and the determination of bound-

aries of private claims, — often a difficult task, owing to their distance from shore.

The laws relating to shell-fish, passed since the date of the last report, are appended. The only one of general importance makes the rights to oyster-grounds personal estate, and not realty, in settling property of deceased owners.

The example of the state of Connecticut, in full accordance with the business sagacity which characterizes her citizens, might well be followed by other states even more deeply interested in oyster-culture. The natural beds of Maryland and Virginia are being rapidly destroyed for commercial purposes, and only a prompt attention to the subject can secure their rescue from impending destruction.

DATE OF VINTAGE.

M. Angot contributes a long discussion of the date of vintage in France to the annals of the *Bureau central météorologique* for 1883, issued with date of 1885. His data for some stations reach back to the fourteenth century, and, for a good number, back well into the eighteenth century. His conclusions may be briefly summarized as follows: 1°. The date of vintage varies greatly from year to year, and may in a single country differ by more than seventy days in different years. 2°. The date of maturity depends chiefly on the vines having received a certain quantity of heat, well determined for each species. 3°. Slight variations in the mean date of vintage are found; but these variations are unlike in neighboring regions, and they show no persistent deterioration of climate. 4°. No relation is found between the date of vintage and the sun-spot cycle. 5°. Abundant vintages occur in rather warm years, with nearly normal rainfall: they are less dependent on a concurrence of favorable conditions than on the absence of frosts, hail, diseases of the vines, etc. 6°. Years of good wine have a notable high temperature from June to September, and generally a slightly deficient rainfall. 7°. Years of poor wine are cool in the summer, with rain a little above the normal. Since 1880, detailed observations have been made on the vintage in France, and in future it will be regularly discussed.

The accompanying cuts are reduced from Angot's plates. Fig. 1 shows the budding of the vine in spring-time, as determined by the arrival of the mean diurnal temperature of 9° C. (48° F.), which is provisionally accepted as the time of the beginning of its vegetation. The position of this isotherm for every ten days of February, March, and April, is given by heavy lines: for some intermediate dates, by finer lines. The epoch of vintage in the autumn is similarly expressed in Fig. 2.

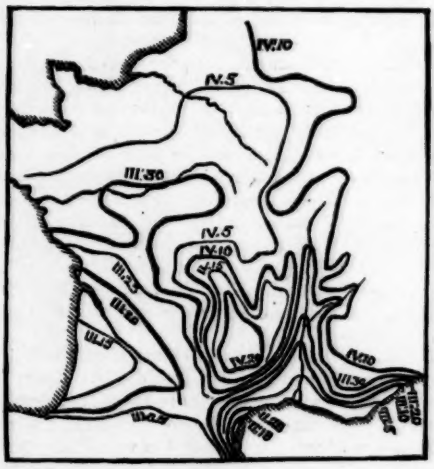

Fig. 1.

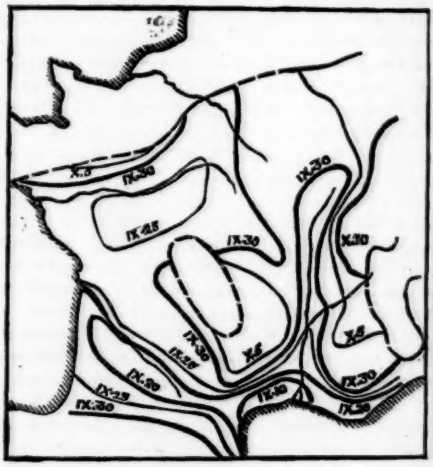

Fig. 2.

The same author has also attacked the distribution of heat on the earth as directly furnished by the sun, giving the basis of what Hann calls the solar climate. Meech is most frequently quoted on this question, and Ferrel has lately discussed it; Angot adds the consideration of various coefficients of atmospheric transparence, and thus makes a step from the theoretical towards the actual. For example: according to Meech, the

heat received in twenty-four hours from the sun on the summer solstice is not greatest at latitude 23½°, where the sun is vertical, but has two maxima farther north, — one at 43° ; the other and greater at the pole, with a faint minimum at 66° ; because the sunshine at the pole through twenty-four hours, at a constant altitude of 23½°, is greater than the sunshine in the twelve-hour day at the tropic, with the sun vertical only at noon. But this gives a very erroneous idea of the temperatures at these latitudes. Now, on the assumption that two or three tenths of a vertical ray are absorbed by the atmosphere, Angot finds the maximum of heat received at the bottom of the atmosphere on the solstice has its maximum at 37°; farther north, the heat received diminishes continuously to the pole, rapidly at first, then slowly beyond the polar circle ; and this is fairly conformable to the distribution of temperature. An interesting calculation shows, that, on account of our less distance from the sun in December than in June, the latitude circle about 2½° north, and not the equator, receives the same amount of heat on the two solstices : the equator, therefore, belongs in this respect to the southern hemisphere. The memoir is illustrated by an instructive series of curves showing the distribution of heat over the earth at numerous dates. W. M. D.

SODA AND POTASH IN THE FAR WEST.

IN view of the large quantities of soda and potash in various forms that are imported into this country, it is surprising that the abundant supplies of these alkalies within our own borders are not more extensively utilized.

It is probably known to all American geologists that there are extensive deposits of the chloride, sulphate, and carbonate of soda at many points in the arid regions of the far west, which may be had for the trouble of gathering. These deposits occur in the desiccated beds of ancient lakes in Nevada, Arizona, western Utah, and portions of California and New Mexico. There are certain lakes, also, which are valuable brines.

In the basins where evaporation has been nearly or quite complete, the alkaline salts occur either at the surface, when they appear like fields of snow frequently many square miles in extent, or they may be concealed beneath the layers of fine mud known as playa deposits. Again, large areas in Nevada and Arizona are white with alkaline salts that have been brought to the surface in solution, and deposited when the waters evaporated. These efflorescences are frequently rich in sodium carbonate, sulphate, and borate, and have been utilized to a limited extent at a few localities.

The lakes of the far west which are likely to become of commercial value on account of the alkaline salts they contain are Great Salt Lake, Utah ; the Soda Lakes, near Ragtown, Nevada ; Mono and Owen's lakes, California ; and Summer and Abert lakes, in Oregon. All of these are without outlet, and owe their high percentage of mineral matter to the concentration by evaporation of the waters of streams and springs with which they are supplied. Their chemical composition is shown in the following table : —

CONSTITUENTS.	[1] Great Salt Lake, Utah (1869).	[2] Soda Lake, Nevada (1863).	[3] Mono Lake, California (1863).	[4] Owen's Lake, California (1875).	[5] Abert Lake, Oregon (1868).
Sodium (Na)	49.690	40.919	18.100	21.650	2.778
Potassium (K)	2.407	2.857	1.111	2.751	10.687
Calcium (Ca)	0.255	.....	0.278	trace	.....
Magnesium (Mg)	3.780	0.245	0.125	trace	0.402
Lithium (Li)	trace	.....	.....	trace	.....
Chlorine (Cl)	88.946	40.851	11.610	13.440	8.220
Bromine (Br)	trace	.....	.....	.....	.....
Carbonic acid (CO_3)	.....	16.854	11.465	13.140	4.647
Sulphuric " (SO_4)	9.858	11.857	6.520	9.362	0.497
Phosphoric " (HPO_4)	.....	.....	.....	trace	.....
Nitric " (NO_3)	.....	.....	.....	trace	.....
Boracic " (B_4O_7)	trace	0.286	0.153	trace	.....
Silica (SiO_2)	.....	0.278	0.268	0.164	0.064
Alumina (Al_2O_3)	.....	.....	.....	trace	.....
Total parts per thousand	149.936	113.647	49.630	60.507	26.740

1 Analysis by Prof. O. D. Allen, U. S. geol. explor. of the 40th par., vol. ii. p. 435.
2 Analysis by Dr. T. M. Chatard, Bull. No. 9, U. S. geol. surv., p. 25.
3 *Ibid.*, p. 26.
4 Analysis by Dr. Oscar Loew, Ann. rep. chief of eng., U.S.A., 1876, p. 190.
5 Analysis by Dr. F. W. Taylor, Fourth ann. rep., U. S. geol. surv., 1882-83, p. 454.

It is safe to predict that Great Salt Lake will not only be of great value in the near future on account of the immense quantities of common salt it is capable of producing, but also for the sodium sulphate it contains. When the temperature of the lake-water is reduced to 20° F., the separation of sodium sulphate takes place as a flocculent precipitate, which increases in quantity with decrease of temperature. This should suggest to manufacturers a method of obtaining the salt in a pure state and on a large scale. When the temperature of Great Salt Lake is lowered on the approach of winter, its waters become opalescent, owing to the precipitation of sodium sulphate in an extremely finely divided state. During the winter months the temperature of the air in the region of the lake sometimes falls to 20° or more below 0° F., and at such times the separation of sodium sulphate takes place on an immense scale, and it is thrown up on the shore in thousands

of tons. The amount that could be gathered at such times is practically unlimited. As railroads now touch the shore of the lake, the problem of supplying this salt to manufacturers is simplified.

The Soda Lakes, situated on the Carson desert, Nevada, about fourteen miles east of Wadsworth, have already been utilized as a source of sodium carbonate, which is being shipped to San Francisco. These lakes occupy the craters of extinct volcanoes, and the mineral matter they contain has been derived mainly from the leaching of the lapilli and lacustral deposits surrounding them.

Mono and Owen's lakes are now quite accessible by rail, and are capable of furnishing immense quantities of sodium sulphate and carbonate. From data obtained during a recent survey of Mono Lake, it has been estimated that it contains,

Potassium chloride (KCl)	8,998,856 tons.
Sodium chloride (NaCl)	73,524,285 "
Sodium sulphate (Na_2SO_4)	40,636,089 "
Sodium carbonate (Na_2CO_3)	78,649,194 "
Total of salts in lake	209,233,488 "

It has been estimated by Dr. Oscar Loew that Owen's Lake contains about twenty-two million tons of sodium carbonate, and a little less than one-third of this amount of sodium sulphate.

Summer and Abert lakes, situated in southern Oregon, are remote from railways, but are extremely valuable brines on account of the potash salts they contain. These lakes occupy depressions in the bed of an ancient lake of large size, now nearly desiccated, and are very similar in character. Abert Lake alone has been analyzed, but it is probable that its companion has nearly an identical composition. Abert Lake is about fifteen miles long by five miles broad, and has an average depth (varying with the seasons) of approximately ten feet. Summer Lake is perhaps a third larger, and is also shallow; but its average depth is unknown. The percentage of potassium salts in Abert Lake is greater than in any other lake the composition of which has been published, amounting to five-sevenths of the total of solids in solution.

With these abundant resources at hand, the alkali industry of the far west unquestionably has a great future; and it is to be hoped that it will soon receive the attention that its importance demands.

I. C. Russell.

CHOLERA MORTALITY IN EUROPE DURING 1885.

Cholera as an epidemic has now for some time almost entirely disappeared from southern Europe, and hence the following results of the serious outbreak of the past year, from the *Lancet* of Dec. 26, will be of interest: From the mainland no further record of cholera is forthcoming; but in the Christina Islands to the south, near the mouth of the Guadiana River, recurrences of the disease are still said to take place. The actual number of deaths recorded in the provinces and cities named is less than that which really occurred; for the official lists were not published with sufficient regularity to insure accurate records day by day, and outbreaks in some localities were never announced at all. The following is the list of places attacked, with their respective cholera mortalities; the capitals of the several provinces being, except where otherwise noted, included for statistical purposes within their provinces: —

Locality.	Deaths.
Province of Castellon	4382
" Valencia	13400
" Madrid	2228
" Murcia	3580
" Saragossa	10954
" Cuenca	2877
" Alicante	4361
" Toledo	2289
" Teruel	493
" Tarragona	1258
" Albacete	2347
" Jean	1348
" Badajoz	337
" Segovia	351
" Cadiz	368
" Granada	9162
" Cordova	825
" Almeria	3514
" Malaga	685
Province of Zamora	451
" Soria	521
" Ciudad Real	905
" Barcelona	791
" Lerida	821
" Gerona	215
" Navarre	3691
" Valladolid	1482
" Guadalajara	361
" Logrofio	541
" Burgos	199
" Huesca	69
" Palencia	374
" Santander	194
" Salamanca	84
Aranjuez, pr. of Toledo	835
Gibraltar (English)	24
Gibraltar (Spanish lines)	191

In France the disease was all but limited to Marseilles and Toulon, and to scattered cases in the south, until November, when an outbreak occurred in Brittany, Brest and its immediate neighborhood being affected. The total cholera deaths at Marseilles were just short of 1,000, and at Toulon just short of 200. The number at Brest has not been made known. In Italy only scattered cases occurred at several places on the mainland; but in the city and province of Palermo, in the island of Sicily, a considerable epidemic occurred, the total mortality there reaching at least 2,430. There was also a rumor of cases as late as the present month in the province of Venice.

BURMAH, PRESENT AND FUTURE.

Mr. Holt Hallett, in a recent address before the London Society of arts, on 'Burmah,' said: In these days, with foreign competition getting keener every day, and hostile tariffs not only shutting the Europeon markets against us, but in a lesser degree American and English colonies also, with the race for fresh colonies and new markets among European powers, it is of importance that we should avail ourselves of our present opportunity for an inland connection and

commercial alliance with Indo-China and China, and thus acquire new markets of transcendent promise.

Burmah and the Burmese Shan states are highly favored by their geographical position. They lie in the course of the monsoons, and are gifted for the most part with a plentiful rainfall.

The Irrawaddy is a river which discharges about 420,000,000 metric tons of water during the year. The river is about 900 miles in length, the last 240 being in British territory. As far south as Akouktoung its bed is rocky; farther down it is sandy and muddy. New sand-banks are continually forming, and old ones being removed, which renders it necessary for the steamers plying between Rangoon, Mandalay, and Bhamo, to have a service of pilots upon the river. In the rainy season, steamers and large boats enter the main river from Rangoon by the Pan-Hlaing Creek; but during the dry season they have to descend the Rangoon River for some distance, and proceed by different routes into the Irrawaddy.

The Khyeng-dwen is navigable for the largest boats plying on the Irrawaddy, and for steamers certainly as far north as Kendat, and most likely as far as the rapids which occur a little above the junction of the Ooroo River. A great deal of grain is grown in the lower portion of Khyeng-dwen valley, and likewise in that of the Ooroo, near the sources of which are the serpentine mines. The lower portion of the river passes through a broad, populous, and fertile champaign, and presents an almost continuous horizon of palmyra-groves, always in Burmah a sign of population and culture. From these there is a considerable manufacture of palm sugar. The sugarcane is generally used by the Burmese merely for munching; but, according to Colonel Yule, a little sugar is made from the cane in the neighborhood of Ava.

Bhamo, on the course of the Irrawaddy, is the entrepôt of trade for north-western Yunnan, and will certainly become under our rule a place of great importance, as it is the terminus of the shortest caravan routes into western China. For some time it was proposed by many of our officials to improve the caravan route by the construction of a wheeled road, and even a railway; but subsequent explorations have shown that although Bhamo, which is 430 feet above sea-level, is only 250 miles distant in a direct line from Talifu, yet a railway would have to be 600 miles in length to connect these places. The cost of a railway connection by this route would be at least four times as great as that proposed by Mr. Colquhoun and myself, which, besides, has the great advantage of terminating at a seaport instead of at a town 840 miles up a river, of opening up the whole of central Indo-China, and of passing through a much more fertile and better populated region than would be traversed by the other route. Bhamo will no doubt, before long, be joined by rail, *via* Mandalay, to our Rangoon and Tounghoo railway, and subsequently to the Indian system at Dibrugarh; thus tapping the whole of the passes leading from the west of the Shan states, and completing one of the schemes long ago proposed by my colleague and myself.

The inhabitants of Burmah, owing to the excellence of the climate, are robust and healthy looking. They attain the average length of human life, and children especially thrive in the country. The registration returns show that in Burmah the deaths of children under five years of age are in the proportion of 27 to 85 of the total deaths at all ages, whereas in England they are 40 per cent. Concerning the characteristics and peculiarities of the Burman, much need not be said. His virtues, which are many, and his failings, which are not a few, are much the same here as in every part of his extensive country. He here, as elsewhere, displays much spasmodic energy and general laziness; much love of feasts and shows; much disregard of the sacredness of human life, and much tenderness for the lives of inferior members of the animal kingdom; much arrogance and inconsiderateness when placed in high position; and last, though not least, much general truthfulness, and, among unsophisticated villagers, the very un-oriental trait of being quite unable to tell a specious falsehood, — a trait which is as honorable to himself as it is agreeable to those who have the government of his country. His occupations are cultivation on a small scale and petty trading. Actual poverty is almost unknown, but riches are never accumulated. The Burman is strongly distinguished from the Indian races by his love of sport and amusement, and his strong turn for the ridiculous. The Burman is in every way a marked contrast to the Hindoo. Their women-folk mix freely in all social gatherings on perfectly equal terms, and form a very important factor in society.

Proceeding to speak of British Burmah, Mr. Hallett said that only one-half of the area of that country is culturable, and only one-seventh of that half is under cultivation. Taking the present population at 4,000,000, there is room for 24,000,000 more without overcrowding the province. Even now about 1,000,000 tons of rice are exported every year, after feeding the population, cattle, and elephants.

It is therefore certain, that, if all the reclaimable waste lands were brought into tillage, Burmah would be unrivalled as a granary. The population of British Burmah has increased from 2,747,141 in

1872, to 3,736,771 in 1883. Trade has more than kept pace with the advance of population and revenue, as the following figures will show: In 1874 the imports were £1,859,095, and in 1883, £3,772,887. In 1874 the exports were £3,480,407, and in 1883, £7,039,525. The relative increase of the imports is somewhat greater than the increase in exports; but, with the balance of trade so strongly in favor of the province, its capacity as a consumer of British manufactures is very imperfectly measured by the actual value of the imports. Again: the comparatively small amount of those imports demonstrates conclusively that upper Burmah has acted as an effectual and insurmountable barrier between the port of Rangoon and those illimitable commercial requirements of western China and the Shan states which it has been the hope of the government and merchants alike to ascertain and to satisfy. Rice represents 80 per cent of the total exports. The other chief exports are teak, cotton, jade, petroleum, spices, tobacco, hides, horns, ivory, India-rubber, shellac, cutch, and drugs. Of these, teak forms 7 per cent of the total exports, and cotton 2½ per cent.

The statistics of the province show that one of the chief wants is population, — a want which our connection with India and China would make it easy for Madras, Bengal, and China to supply, thus adding materially to the producing capacity and general prosperity of the province.

SOME RECENT TEXT-BOOKS ON METHODS IN MICROSCOPIC ANATOMY.

The rapidity of the improvements recently made in methods devised for carrying on all kinds of zoölogical investigations has resulted in the establishment of journals largely, or even exclusively, devoted to the diffusion of information in technic. The amount of valuable experience already acquired over a field much broader than that covered by the older text-books on histology has rendered it imperative that the sources of this widely scattered information should be systematically reviewed with the purpose of collecting its important and really valuable elements, and putting them into a shape convenient for use both by beginners and by such investigators as are wise enough not to waste time by remaining content with the scanty methods and appliances of twenty, or even ten, years ago.

The value of the text-book which summarizes the present acquisitions in this field will depend upon several things, but principally upon the critical knowledge and experience which its author brings to bear on the selection of material, and the method of treating his subject.

Since the publication of the first part of Fol's 'Lehrbuch der vergleichenden mikroskopischen anatomie,'[1] in 1884, there have appeared several books having this general purpose in view. The immediate aims of the three mentioned below[2] are not quite identical: each fills a place not fully occupied by either of the others. The first is primarily intended for the beginner, to whom sources of difficulty and their remedies are explained; the third, while intended first of all for 'the instructed anatomist,' also aims to be of use to the beginner; the second takes a middle ground between the other two, in that it does not aim to be 'an exhaustive treatise of the subject in any of its aspects,' but endeavors to meet 'the every-day needs of a zoölogical laboratory.'

In a small pamphlet of about forty pages, Kükenthal has brought together concise practical directions covering the more important of the recent technical methods employed by zoölogists. The statement in the preface that this little book contains nothing essentially new is realized. At the same time, it meets very satisfactorily the needs of a beginner: for the selections made are, on the whole, judicious; and the descriptions, though brief, are intelligible and to the point. About one-third of the book is devoted to the processes (illustrated) of embedding (chloroform-paraffine), sectioning, and affixing sections; but the space devoted to embedding in gum, albumen, and celloidin, is too brief to be of much service. Its compact and unpretending form puts this little pamphlet within easy reach of every beginner, and those to whom German is no impediment will find it serviceable.

Whitman's work is an immediate outgrowth from his editorial labors, in connection with the department of microscopy in the *American naturalist*; but it is much more than a compilation of matter already published there. Although the book is called '*Methods* in microscopical anatomy,' etc., its scope is somewhat broader than that of the two other works, for '*material* and *methods*' sums up the author's view of the needs of the zoölogical laboratory; and upon both points he aims to be of service.

Part i. deals with general methods, which are

[1] For a review of Fol's book see *Science*, vol. v. p. 510.

[2] *Die mikroskopische technik im zoologischen praktikum.* Von Dr. Willy Kukenthal. Jena, *Fischer*, 1885. 16°.

Methods of research in microscopical anatomy and embryology. By Charles Otis Whitman. Boston, *Cassino*, 1885. 8°.

The microtomist's vade-mecum; a hand-book of the methods of microscopic anatomy. By Arthur Bolles Lee. Philadelphia, *Blakiston*, 1885. 12°.

introduced by a few pages intended to orient the beginner as to the proper sequence of steps in the more difficult work, and to acquaint him with the facts and underlying reasons connected with killing, hardening, and staining. The chapter on reagents (preservative, macerating, decalcifying, etc.) is followed by methods of staining, metallic impregnations, and bleaching. Microtomes, together with their auxiliaries and methods of embedding (freely illustrated), occupy two chapters, and the remaining three of the first part are devoted to methods of fixing serial sections, to mounting media, etc.

The second part, which occupies about half the volume, contains some matter not previously published. About fifty pages are devoted to 'embryological methods.' This chapter furnishes much valuable information, but the arrangement leaves the impression that it is the result of fortuitous reading rather than a methodical search for the most valuable things within the scope of the topic. The chapter on 'Times and places of ovulation' serves at least to call attention to the desirability of a more extensive compilation of the facts hitherto published on this subject, as a means of aiding less experienced students in their search for embryological material. The methods employed in studying karyokinesis during cell-division and in the preparation of nervous tissue are considered separately from 'Histological methods,' without any very apparent reason. The important methods of reconstructing the object from microscopic sections introduced by His, Born, and others, form the concluding chapter, which is followed by an appendix principally devoted to recent methods of injecting.

Although not exhaustive, nor perhaps symmetrically planned, both the matter and the manner of the book commend it to every advanced and advancing zoölogist as well as to beginners; and it is for that very reason that one interested in real scientific progress the more regrets to see a publisher possessed of the idea that his interests demand the production of a book twice as bulky and twice as expensive as it need be.

Lee's book is the outcome of a more pretentious undertaking. The author has desired to produce 'a concise but complete account of all the methods of preparation that have been recommended as useful for the purpose of microscopic anatomy.' Whatever opinion one may entertain about the desirability of a manual framed on so catholic a plan, it must be admitted that the author has brought together an immense amount of material in a compact and handy form, which goes far toward saying it will get used; for the bookmaker who makes books for any but people of superfluous leisure, must make them so that they can be consulted without waste of time.

Notwithstanding a natural prejudice which one experiences when an author declines to use his judgment for the reader's benefit, it must be granted that Lee's work is not edited without discrimination, for the brief but valuable introductions which precede the more important topics show that the author is fully alive to the principles underlying manipulations. The citation of the sources of the formulae gives to the student the requisite opportunity for ready verification and control, and the plan of using serial numbers to indicate the successive sections of the book is economical both for author and reader. The latter would have been spared much time, if a column for page-references had been added in the index.

The 'vade-mecum' is practically without illustrations, and, although supposed to be 'exhaustive,' appears to have ignored the important aids to killing animals in a distended and natural condition which are afforded by certain stupefying reagents, such as nicotine, chloral hydrate, etc.

The author defends the nature of his publication — from which "no process having any claim to scientific status has been rejected, nor any (he trusts) unwittingly omitted" — on the ground that (though "a large proportion of the formulae are quite superseded in modern practice") "some one or other of them may perhaps serve, in some way that cannot now be foreseen, to suggest some new method of value;" and he enforces his opinion by reference to the history of the use of corrosive sublimate. He, however, uses the knife (and how could he fail to?) when he comes to the matter of 'cements and varnishes.' The magnitude of the undertaking has also compelled him to modify his original plan of making the second part traverse the entire field of histology and microscopic zoötomy, "giving the student detailed instructions for the examination of all structures that have hitherto been studied, and thus making him entirely independent of all help from a teacher."

The author, therefore, limits himself in the special part to about one-fourth of his four hundred pages, and considers in it 'only very special cases,' such as cell-division, the microtomy of the human brain, etc. The histological part of the field has received much the larger share of attention, — the nervous system, nerve terminations, sense-organs, being very fully treated, — and the embryological only a fragmentary consideration. For this reason and others, the works of Lee and Whitman supplement each other in such a way that no one actively engaged in microscopic work can afford to dispense with either.

COOKING AND DIETING.

It was the privilege of the writer of this notice in August, 1884, to listen to a lecture on the chemistry of cookery, given at one of the conferences at the health exhibition in London, by the genial and enthusiastic author of the volume first named. After having personally urged the immediate publication in America, in book form, of his papers then appearing in the *Popular science monthly*, it can only be possible for the present writer to urge American readers to avail themselves of so much valuable information and sound sense, served up with so much entertainment as Mr. Williams furnishes in his manner of presentation, — a manner well calculated to catch the popular eye, but which at first glance may prejudice the scientific reader. A critical reading from the stand-point of a cookery chemist, as well as from that of a chemical cook, has failed to reveal any errors of statement as to the present condition of scientific knowledge on the subject of cookery. There are many doubtful points, it is true; but they are well stated in the volume before us, and the lines on which further research is needed are clearly indicated. The author, himself a living exemplification of the fact that good cookery allows good health and good spirits, is a chemist and metallurgist, a student yet, though he is rather past middle life. He shows himself well acquainted with laboratory methods of experimentation, and also with practical cooking.

In Mrs. Henderson's book one is startled to find recommended as 'diet for the sick' a slice of Boston brownbread, with cream, for breakfast; fricassee of chicken, with potatoes *à la crême*, for dinner; macaroni and tomato-sauce, with pear compote, for tea. Evidently the author means by the sick, invalids and convalescents, people with delicate appetites which need to be tempted by dainty service and pleasant flavors. The book is not one for the hospital nurse, but for the lady companion of invalids and elderly people who cannot take exercise. The recipes seem to be excellent, and the directions for serving so as to increase the enjoyment of the food are admirable in points too often overlooked. The author has endeavored to incorporate the latest theories of diet into the cook-book with an enthusiasm which may prove to be well founded, and which may not. Grape-juice and hot water have become pretty well established: peptonized foods, koumiss, and whole wheat are less certain to hold their own. While the practical part of the book is so worthy of praise, it is to be regretted that the first chapter on the chemical composition of foods had not been omitted, or at least revised by a chemist.

The chemistry of cookery. By W. Mattieu Williams. New York, *Appleton*, 1885. 12°.

Diet for the sick. A treatise on the values of foods, their application to special conditions of health and disease, and on the best methods of their preparation. By Mrs. Mary F. Henderson. New York, *Harper*, 1885. 12°.

Last April Mrs. Caroline Dall delivered an address in Washington, D.C., before the Shakspeare club of that city, on which occasion she refuted certain statements made by Mr. Donnelly respecting the 'cipher,' and various assertions of other parties relative to the ancestry, education, and character of the poet. These replies have now been embodied in a volume of some two hundred pages, entitled 'What we really know about Shakspeare' (Boston, *Roberts*, 1885). The author declares that she has endeavored to prepare a work which will show at a glance such facts pertaining to Shakspeare's history as are substantiated by contemporary testimonials and existing documents. In this she has admirably succeeded; but, as her book is intended principally for the use of beginners, it might be as well not to confuse them with theories such as those respecting Anne Hathaway's parentage, and her husband's travels in Germany and Italy. However, aside from a few minor speculations of this nature, the work is an admirable one, which cannot fail to assist the student by reason of its concise chronological arrangement, and the excellent index which terminates the volume. Those who are familiar with the plan of Mr. Tweddell's work, published some thirty years ago, will appreciate the labors of Mrs. Dall; and, in view of this fact, we sincerely trust that Mr. Halliwell-Phillipps will forgive her for misspelling his name whenever she has had occasion to quote it.

In Grand Lake, Sandy Lake, and other bodies of fresh water in Newfoundland, seals are known to breed in abundance, never visiting the sea. Like habits are said to be found in these animals inhabiting Lake Baikal in central Asia, twelve hundred and eighty feet above sea-level. In a pamphlet by Mr. Harvey, entitled 'Across Newfoundland,' the author is of the belief that these fresh-water lakes of Newfoundland have undergone a gradual change from a previous brackish or salty condition, and that the inhabitants have by degrees adapted themselves to their changed conditions. Grounds for this belief are afforded by the fact that other large bodies of salt water in Newfoundland are during periods of the year cut off from the sea, and might readily become permanently separated.